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ABSTRACT

Complementing a 1973 survey of management information systems in state departments of education, the conclusions developed in this study present an overview of MIS development and implementation in six states: Georgia, Iowa, Maryland, Oregon, Texas, and Utah. In-depth case studies examine the concerns of MIS personnel and provide insights developed by experienced persons regarding MIS problems and their potential solutions. The departments of education responded to interview questions concerning understanding and planning of MIS, determination of user needs, identification and procurement of resources, scheduling MIS development, accountability and MIS, and evaluation of MIS. Appendices include the interview schedule and a taping agreement. (Author/RAA)

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THE STATUS OF MANAGEMENT INFORMATION SYSTEMS (MIS) IN STATE DEPARTMENTS OF EDUCATION CASE STUDIES

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THE STATUS OF MANAGEMENT INFORMATION SYSTEMS (MIS) IN STATE DEPARTMENTS OF EDUCATION: CASE STUDIES

ABSTRACT

Purpose

This paper is an attempt to look at some of the more pressing problems and issues in the development and implementation of management information systems (MIS) in state departments of education (SDE). In February 1973, the staff of the Center for Cooperative Research with Schools, The Pennsylvania State University, conducted a nationwide questionnaire survey to determine the status of management information systems in state departments of education. The questionnaire survey provided a basic framework of the concerns, problems, and issues in the development and implementation of MIS in SDE's. This paper complements the national survey by providing in-depth case-study interview results. It is also intended to provide an index of the frustrations and concerns which MIS personnel must face, as well as share the insights which experienced persons have developed regarding MIS problems and potential solutions.

Methodology

Six states participated in the interview sessions. Types of people interviewed were: associate state superintendents, directors of planning and evaluation, directors of management information systems, program and project managers, management information system staff, and directors of data processing. Interview topics included: understanding of MIS; involvement in planning MIS; determination of user needs; identification and procurement of financial, material, and personnel resources; scheduling the development of MIS; the relationship between MIS and accountability; and evaluation of MIS.

Conclusions

States have used a variety of definitions and models in their MIS development. Each state tends to work on its own model, which seems to be in an almost constant state of revision. The factors most responsible for development of an MIS were the needs for reporting information to federal and state governmental agencies and the availability of federal funds to support MIS development. While this shows responsiveness to a specific need and to opportunity, it appears inadequate from the point of view of conceiving MIS as integral to organizational functioning – a view espoused by leading management specialists.

The state superintendent was seen as an advocate for MIS development. However, many middle management personnel tended to demonstrate high anxiety and/or indifference to MIS development. In order to foster understanding, it is necessary to promote involvement, have MIS personnel who are accepting and patient, and provide potential users with examples of satisfactory service and quick pay-off.

Most states have given up on attempting to develop a global MIS to serve the total state department of education. Instead, they have attempted to develop separate components, which might be conceived as parts of a total MIS, to serve specific operational needs. These components draw from an integrated or semi-integrated data base.

The extent to which potential MIS users are involved in all phases of MIS development and implementation is a critical predictor of MIS success. The key to involvement is personal contact which occurs in a responsive and reinforcing environment. Attempting to force involvement or provide token involvement usually results in mistrust and frustration for both MIS users and staff. It is vital to foster a sense of ownership through developing an understanding of the benefits and limitations of MIS and promoting the feeling that it is the user's information system.

User needs must be determined through a careful, time-consuming analysis of existing data mechanisms and identification of user concerns and problems. Specifications must then be developed for the MIS in terms of input, data manipulation, and output. It is necessary to coordinate data collection specifications across all agencies in the state department. Orientation programs must be carefully developed through the use of examples of MIS outputs and conducted in a non-threatening atmosphere.

Financial resources are always a concern of MIS developers. Most of the money that has been used has been from federal grants supplemented by state funds. The lack of funds has resulted in scheduling difficulties and lack of ability to hire needed staff. However, the MIS personnel consider the scarcity of funds as somewhat of a positive influence, in that it forces development at a more controlled, efficient pace.

Material resources do not seem to be a major problem.

State departments of education seem to have access to adequate computer hardware and storage. There is a need for more efficient software development. The practice of purchasing software packages from outside contractors is not very satisfactory. MIS personnel would much prefer to have software packages developed by in-house personnel rather than by consultants and contractors.

Probably the most critical resource required for MIS development is personnel. Almost all of the people working on MIS have come from within the state department of education or other state agencies. They must have the ability to communicate and develop rapport with potential MIS users.

Contractors and consultants have not provided a great deal of help in MIS development. State MIS personnel are quick to admit that they must share the fault for this because of lack of ability to communicate exactly what they expect to be produced by contractors and consultants and lack of ability to supervise the work being done.

State MIS personnel indicated that it was difficult to keep MIS development on schedule for several reasons. Among them were: insufficient financial resources, lack of personnel, and the necessity of waiting on management decisions. All of the MIS directors stressed the need for flexibility of scheduling.

The MIS is seen as having a critical role in any accountability or state-wide educational assessment program. Until accountability has been defined operationally in the state, the MIS role and output requirements cannot be completely determined. It is critical that MIS personnel should be deeply involved in the determination of a state's accountability model.

States have not conducted evaluations of the MIS on any highly formalized scale. To the extent that it exists, formative or process evaluation is built into the MIS design and specification. There is little in the way of systematic feedback, however. User feedback is mostly in terms of informal communication, rather than through a formalized process evaluation design, where information is collected on a regular basis and checked for relevancy, reliability, and validity. About the only summative or product evaluation has been in terms of verbal or written comments made by MIS users in relation to MIS products. It is difficult to develop summative evaluation designs on a formalized basis because there is no one "product" coming from the MIS nor are there necessarily the same products from one time to the next. Product evaluation designs may be a critical concern when the MIS is more fully implemented.

A great deal of time, financial, and personnel resources have been expanded in the planning, development, and implementation of MIS in state departments of education. Progress is slow and many times very frustrating. The state MIS personnel demonstrate a strong commitment to their task and seem to be making good progress in the face of constraints and attitudes which sometimes seem impossible to overcome.

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I. RATIONALE FOR THE PAPER

In February 1973, the Center for Cooperative Research with Schools completed a nationwide questionnaire survey, titled "Status of Management Information Systems (MIS) in State Departments of Education." This survey was sponsored by the Alabama State Department of Education. A rather lengthy questionnaire was mailed to MIS personnel in the 50 states. A high (84%) response rate was achieved and the results presented in a project report. The use of a questionnaire was seen as the most economical manner in which to collect data from as many states as possible, and the high response rate does provide a good basis for making general inferences about the status of MIS in SDE's. One potential problem in using a questionnaire approach is the inability to obtain in-depth responses in terms of respondents' attitudes, opinions, and reasons for doing or believing something. For this reason, personal interviews were conducted with six selected states in order to obtain in-depth information regarding specific problems and issues in the development and implementation of MIS. This report is considered to be complementary to the nationwide questionnaire survey. The survey provided an outline; this report is intended to provide the substance to fill in around the outline and make the picture as complete as possible.

II. METHODOLOGY

Seven primary areas of potential problems and issues were identified from the literature and the nationwide survey conducted by the Center for Cooperative Research with Schools:

1. Understanding of MIS in the SDE
2. MIS staff and potential user involvement in planning of MIS
3. Determination of user information needs
4. Identification and procurement of resources
5. Scheduling MIS development and implementation
6. The relationship between MIS and accountability
7. Evaluation of MIS.

An interview schedule was prepared by the staff of the Center for Cooperative Research with Schools. The interview schedule was reviewed by personnel in two state departments of education, and revisions were made prior to its use in the field.

Five states were originally selected to be the sites of the in-depth interview: These states were chosen on the basis of their answers to the survey questionnaire, and of common knowledge that they have committed major resources for at least two years to the planning, development, and implementation of a comprehensive MIS in their state departments of education. A sixth state was added as a result of information received in the course of interviews in the original five states.

In an attempt to obtain complete cooperation and accurate results, the personnel interviewed in the six state departments of education were insured confidentiality of their responses. In this paper no specific references will be made to the responses of particular individuals or of states.

The results of the interviews have been organized on the basis of the seven primary problem areas. Following the presentation of the interview results, the authors draw some broad conclusions. The interview schedule is included in the Appendix A.

III. UNDERSTANDING OF MANAGEMENT INFORMATION SYSTEMS IN THE STATE DEPARTMENT OF EDUCATION

In the nationwide survey to determine the status of management information systems in state departments of education, the problem which was ranked as most difficult was "lack of understanding and knowledge in the SDE about the complexity of information services." The purpose of this section is to take an in-depth look at this problem by considering the responses of SDE personnel to questions relating to:

1. Definitions and models of MIS
2. Factors leading to consideration to plan an MIS
3. Advocates for and opponents to MIS development
4. Strategies used in MIS development
5. The location of MIS in the SDE organizational structure
6. Procedures used to promote understanding of MIS.

1. Definitions and Models of MIS

In general, the definitions stated all have a common theme; "The MIS is a system of providing information to managers." Several of the respondents were rather reluctant to attempt to provide a "dictionary" definition of MIS. Many hastened to point out that the organization has always had an MIS and that what they were trying to do was make information production and utilization more systematic, efficient, and responsive to organizational needs.

A few of the states have used the Midwestern States Project as a model for MIS development. All of the six states saw the need for an integrated data base, the need for appropriate and timely access to the data base, and the minimization of duplication of data collection. None of the six states felt that they have achieved this state of affairs, though most were making good progress toward this goal through the analysis of data needs, forms control, and modern data processing techniques.

All of the states had looked at MIS models developed in the literature, in business, in other state departments of education, etc. There was general agreement that no satisfactory model of an MIS in education exists. As one state put it, "information services of this agency have largely been focused on the reporting functions and the budgetary functions; it has only been of late that educational people have begun to recognize the value of information for decision-making purposes."

It was apparent that each state is developing its own model and that this model is continually in a state of revision. One state told us that their model changed every day. As another put it, "there's nothing that we could probably come up with that would be static long enough to really implement it." Two of the states stressed that it was impossible or a waste of time to develop an MIS model without first specifying a "state department of education management system." "First of all," one of them said, "we have to know about management of the total system, and we recognize that there are a number of levels within the management requirement that we have. This includes the local district, the state, and the U.S. Office of Education levels. In terms of information related to management and operations, the key requirement is to support decision-making at all levels, and the information system must help deliver the information to meet management needs of the local, state and federal components of the total system." Another state put it, "you can't define a management information system until you define the management system."

In general, each state had a definition of MIS that was somewhat broad in scope, and the models that they used were, for the most part, ones that they had developed in relation to their own state departments of education. Models were continually revised and were looked on as working drafts rather than static paradigms. One state summed it up, "It's really an evolutionary process. I'm not sure we'll ever reach where we want to go and say we've arrived, but it's something we just work on all the time. It evolves, it takes a long time, it's a constant dialogue of defining what he (the user) wants and having a staff available to assist him in defining it and bringing it about."

One state saw a need to recognize the differences between small, medium, and large management information systems, although there were no criteria identified to classify MIS's in this manner.

2. Factors Leading to Consideration to Plan an MIS

States have initiated development of an MIS primarily for improvement of information utilization in reporting and decision-making. There have been several factors which have served as catalysts to speed up the implementation of the MIS in state departments. Apparently, the most critical was the need for reporting educational information to meet federal requirements. However, state department personnel were quick to see that the development of an MIS had the potential to serve many information requirements ranging from federal needs, state government needs, inter-agency needs, local government needs, and local education needs. Also, MIS development provides a potential solution to the problem of trying to coordinate more carefully the needs for data at all levels -- federal, state, and local. One phrased the problem and the opportunity for solution in this way, "If there could be more common agreements about what it is that we really need to know, and if we could work out common definitions, then when we picked up an item in one location for one purpose, it would serve us all across the board, at local, state and federal levels."

More specifically, factors which led to developmental work on an MIS were: need for accountability information; need for program review and evaluation information; need to improve local school reporting, planning needs; and the opportunity to receive federal funds for MIS planning and development. After MIS work began, for whatever reasons, many SDE personnel developed a deeper understanding of the need for information and of the ways it should be used.

3. Advocates for and Opponents to MIS Development

In principle, there seem to be many advocates for the development of an MIS in the state departments of education and very few persons who demonstrated an overt opposition to it. In all six states, the state superintendent was perceived as an advocate of MIS, but in varying degrees. In one state, the superintendent was so strong an advocate that he gave direct orders to all department units to participate in the development and operationalization of the MIS. However, advocacy was generally a bit more restrained, with the superintendent demonstrating genuine support for the MIS and strongly encouraging department units to participate, but not directly ordering participation. MIS personnel, in general, favored the latter approach since it seemed to be less threatening than the former to potential MIS users.

The heads of the budgetary, planning, research, and evaluation units were strong advocates for the development of an MIS. In general, other unit heads were somewhat skeptical and/or indifferent to its development. Many "just didn't see the immediate payoff to them," while others saw the MIS as a threat to their operational efficiency. The key to overcoming this problem is the approach used by persons in charge of MIS development and operationalization. A genuine rapport plus demonstration of the advantages that an MIS can provide is essential. This problem will be discussed in more detail in the next section on involvement.

4. Strategy of MIS Development

One of the areas of much interest in state departments of education is the strategy of MIS development. There seemed to be two general developmental patterns. One is the development of a global, fully integrated management information system, which includes all SDE functions and program areas. The other approach involves the development of components of MIS relating to specific functions and specific program areas, with the intention of integrating the components after development. All of the states indicated that their original thinking was to develop a global MIS to serve all agency functions. All of the states except one, however, have concluded that the development of individual, but not necessarily independent, components of the MIS is the best way to proceed. Thus, the concept seemed to be that there are several MIS's in the agency which draw from an integrated data base. As one state put it, "integration used to be a valuable concept in information design, but I think we're getting to the point where we need some payoff. Quick payoff will do more for the development of MIS than will integration."

All of the states indicated a strong interest in the development of an integrated data base to serve the entire agency.

The decision of which MIS components were to be developed at which time seemed to be based on priorities set by the superintendent and/or the interest displayed by persons in charge of operational units within

the state department. There seemed to be a wide variance in degree to which operational units were interested in and capable of participating in MIS development.

5. The Location of MIS in the SDE Organizational Structure

Another problem area is the location of the MIS personnel in the state department of education. In two of the states, MIS staff were housed in the office of an assistant superintendent, while in the other four states, they were housed within the planning, research, and evaluation unit. It seems, however, that the location of the MIS staff was less important than the personalities and approaches of the personnel that provide the interface between the MIS and operational units. One state felt that "the management information group should be elevated to a place where we do have decision making authority on equal rank as with other operational units. We try not to abuse the authority we have. If you've got such authority, maybe you don't have to use it. If you don't have it, then you're out in left field."

6. Procedures used to Promote Understanding of MIS

The most effective way to promote understanding of MIS is in providing immediate payoff to users, through meetings with managers on an individual basis and showing how the MIS can help assist the agency. Other ways were: state-wide information plans, user's manuals, slide presentations, committees of middle management persons from each major division, and the development of policy statements.

Summary:

1. In generating understanding of the MIS within the SDE, three critical factors seem to be:
    a. the attitude of MIS developers in terms of reducing the threat of the MIS to individual managers
    b. the need for providing immediate payoff to users
    c. the practice of developing individual components of the MIS based on individual operational unit needs with integration of components after individual component development.
2. MIS models, definitions, and place in the organization, while important for other reasons, have less effect on understanding of and commitment to the MIS.

IV. INVOLVEMENT IN PLANNING AN MIS FOR THE STATE DEPARTMENT OF EDUCATION

One of the conclusions based on the nationwide questionnaire survey was that the largest average time spent in MIS development on a single activity is for planning. In MIS planning, meaningful participatory and contributory involvement of a wide range of SDE staff is essential. The representation of top state department of education administrators and institutional staff, including program managers and administrative heads of local educational agencies, is critical for a truly divergent management information system that eventually will serve needs of the total institutionally supported activities.

The involved participants first must understand the focus and limitations of management information system concepts and applications to date. As discussed in the previous section, this is a problem area in itself. General understanding might not necessarily be in a specific technical way, but in a framework that allows the managers to "have a handle on" the benefits such a system might offer them in their particular management role and in information gathering necessary for decisions in that role.

Five aspects of involvement in planning will be discussed:

1. The importance of involvement
2. Types of personnel who must be involved
3. Success in getting involvement
4. The nature of problems associated with getting involvement
5. The importance of fostering a sense of "ownership".

1. The Importance of Involvement

Planners and developers of MIS have learned a great deal about involvement, much of it in a very difficult way. "You see it happen (involvement), but it does take two and three years, and then you look back and ask 'why'? I think if nothing else we've learned patience." "The user must be involved in the development; perhaps the chief reason for MIS failure has been the lack of involvement of the user."

Management information systems can very easily be seen as a conceptual resource to solve problems for others. In the formal involvement of staff, managers must be approached in a manner that they see the management information system as a helping unit and as an asset in the identification and solution of their problems. This view must also be extended to departmental networks for problem solving. If this thrust is successful, managers can take an active role in helping the design of the system because it will help them solve their organizational problems.

As one SDE management information system director pointed out, "We have to come back (to the managers) and say, here is where the department is going, and here is how your program fits into it. How can the program help meet your responsibilities, help you make decisions?"

Only open planning, team cooperation, and commitment can effectively foster the new linkage channels management information system development usually requires. The linkage process is basically a function of communications flow within the formal organization. Our research indicates that the exact nature of informal information and communication flow within the organization must be formally assessed.

2. Types of Personnel who Must be Involved

Personnel who must be involved in MIS planning include potential users, MIS operational staff, and in addition, any person who has decision-making authority over the distribution of resources to the MIS or the MIS longevity.

Involvement should be coordinated by a single MIS staff member. This person must be viewed by others as a credible, non-threatening person who displays a genuine desire to foster meaningful, not just token, involvement.

Persons involved should have some feeling for and awareness of the following:

1. Organizational health
2. Team-building
3. Concepts of management information systems
4. Knowledge of departmental information needs and information flow
5. Interfacing concept of organizational-societal and real world concerns
6. Systems analysis and developmental integration skills.

Many of these topics could be discussed as part of an MIS pre-planning orientation program.

Involvement must occur at all levels of the SDE and with potential suppliers and users outside of the SDE, as much as is feasible. MIS personnel seem to have the support of the top-level decision-makers in the state departments of education, though some of this support tends to be passive. The problem with involvement seems to come at lower management levels. As one MIS director put it, "We have a firm commitment from the top administrators in the department that this (MIS development) will be done, but commitment by people on lower levels is not as strong, from lack of interest or whatever."

3. Success in Getting Involvement

The key to involvement is personal contact. The approach on a one-to-one basis between MIS developers and managers is probably the single most important factor in determining the progress and/or success of MIS planning and implementation. As one MIS staff member stated, "Try to build and instill confidence through satisfactory service. If you show people you can assist them in the way they want to be assisted, then they'll give you more and more to do each time. It's a slow process, but I think that's the way it's built. We don't go in and say, 'We're going to solve all your problems for you tomorrow,' we do just the opposite. Be a little conservative and solve a few of their problems so they'll see we really do wear white hats." Another state director of MIS commented, "There is a lot of public relations work that needs to be done in helping people feel that these kinds of services will actually benefit them, not only improve the information gathering techniques and so on. The outcome will not only be beneficial to them, but will actually make them look better." He went on to make the very significant point that MIS personnel must realize, "we have to give credit to the program people for knowing their area better than anyone else. We can't presume to know all of these special areas. So we have to rely on them for their knowledge, and we have to employ skills in getting from them useful specifications for the definition of their system."

Involvement through questionnaires and printed materials may supplement personal contact, but if they are used without prior face-to-face interaction, the chances of producing meaningful and useful involvement is very small. In many cases, use of other than personal contact methods for soliciting involvement proved to be barriers to future worthwhile involvement. As one state MIS director put it, "you have to develop a certain social lubrication."

4. The Nature of Problems Associated with Getting Involvement

Several examples of problems associated with getting involvement were mentioned during the interviews. One state compiled information needed for MIS development for each SDE division in terms of data gathering, management, evaluation, and planning. "Frankly, it was a failure. Either I couldn't communicate it or the manager didn't understand it or he didn't want to understand. By 'he didn't want to' I mean he's happy with the way he's doing it now. His division is moving now, and there's no sense in bringing in a new problem." Another MIS director said, "We'd go through painful hours of listening to what they'd say, going back and drawing it up and asking, 'now is this what you said?' It takes several meetings, and sometimes, unfortunately, you have to go through the process and produce a list before they realize that it isn't what they want. Sometimes our successes are very negative."

Another stated that often managers are initially "very enthusiastic about the idea, but when they get involved and find out just the effort that it is going to take, people sort of back-off into their own shell or their own empire saying, 'we don't have time for it and you're imposing more work on me'. . . People didn't see the real commitment that was required or the necessity of the commitment. They saw it as an interruption or disruption of their work." Cooperation, commitment and involvement ought to be secured so that it is not viewed primarily as additional work or a 'burden' on the managers. This can only be accomplished by stressing the positive side, showing what the payoff is going to be, and then delivering useful products as quickly as possible.

The introduction of a new, formalized management information system into decision-making is sometimes viewed as a threat by managers who have already put together what they feel is an efficient and functional information-gathering, decision-making, and reporting process. They are afraid the new system will not serve them as effectively as what they already have. Also, the central management information system thrust is often viewed as a mechanism to take some decisions away from local and program units and incorporate these decisions at a higher policy making level. Thus, a loss of control is feared.

One strategy might be to involve program and department managers on steering committees at the onset of management information system development. This would enable the unique factors in their areas to become input criteria for the development of the MIS and thus assure their own needs are met. It is important to note that many state department MIS developers have not been able to include this dimension in their management information system design, with the result that the system is not seen as an asset to special types of programs.

One state director cautioned against what he called "over-involvement of people in committees." He indicated that involvement must be meaningful and not just a token affair.

Another type of involvement problem relates to the possible conflict generated in development of the MIS across several levels of management. Needs at different levels are not always perceived by the personnel involved as entirely congruent, and an MIS component developed exclusively around one set of needs may be seen as conflicting with other interests. In other words, there must be coordination of information needs among all management levels. Data collected at the lowest level must be evaluated and delivered in terms of usefulness at the lowest level as well as its usefulness to higher level management, and so on up through the hierarchy. This rather subtle point rests on the need for holistic orientation in developing the system. Users must be sensitive to the information needs both below and above them. Cooperation and, at times, compromise must be fostered through the nature of their involvement in planning an MIS. One state MIS director commented on the problem in this way: "Although we're first trying to define our problems in terms of top-level executives, we will find that our solutions will probably be in terms of middle management."

5. The Importance of Fostering a Sense of "Ownership"

All of the people interviewed indicated that the creation of a sense of "ownership" among MIS users is extremely important. This sense of ownership can only be attained through involvement and satisfactory service in a non-threatening, accepting atmosphere. One of the states is going through a major, very costly, revision of MIS planning because in the original MIS planning "people really had no ownership in it; they couldn't relate to it." Another state MIS director said that fostering a sense of ownership was "critical, extremely critical; if they're going to use it, they have to feel it's theirs."

Summary:

1. Successful MIS planning and development requires meaningful involvement on the part of:
    a. SDE executives
    b. MIS staff
    c. Potential MIS users.
2. Failure to facilitate meaningful involvement usually results in:
    a. wasted time and resources
    b. needs for major revisions in MIS planning
3. Involvement must be based on personal contact in an atmosphere of patient understanding conveyed by MIS staff members.
4. It is absolutely essential to foster a sense of "ownership" of the MIS with users.
5. It is important to foster relationships between MIS users at various levels of management.

V. DETERMINATION OF USER NEEDS

The purpose of an MIS is to provide a service to decision makers, to help supply the information they need to identify and evaluate alternatives so that their decisions more effectively steer the organization toward its goals. Determining user needs, therefore, is an essential aspect of MIS planning and implementation. The nationwide questionnaire survey presented three conclusions regarding user needs:

1. Less effort to determine user needs is expended than seems desirable
2. Users tend not to have high two-way interaction with the system
3. The degree of satisfaction in serving users is only moderate.

Thus, the process of first defining the information needed by different decision makers and then evaluating the extent to which this information is supplied and used appears to be a weakness in MIS development.

This section will discuss the user needs issue in terms of six general areas:

1. Procedures used to determine user needs
2. Prioritizing user needs
3. Orienting users
4. Input and forms control
5. Ad hoc requests for information
6. Coordinating user needs.

1. Procedures Used to Determine User Needs

Problems in determining user needs revolve around two major issues. First, the process is inherently difficult. Information needed is a function of decisions which have to be made, and often the decisions themselves are not well understood. Even with everybody doing his best, determining information needs is difficult and often exasperating, and it requires in-depth analysis as well as persistence. Second and related to the first, the process depends directly on the cooperation of decision makers; it cannot be successfully completed otherwise. Clearly their cooperation must be more than perfunctory, and this requires that they have a real involvement and contribute their best by their own volition. This is not simply a public relations matter; it is, rather, essential to the process. Users must feel they have been meaningfully involved and not excluded in any way, and they must have ample mechanisms to express their needs as well as their concerns for the project. Otherwise, they will not devote the time and energy required to make the project a success.

On the first matter, that is, the inherent difficulty of determining user needs, information system specialists must be prepared to assist in an effective but non-threatening way. One director of data processing expressed an aspect of the problem in this way: "In many cases when a user approaches you with a problem, about the only thing he really knows is a symptom of whatever he's trying to resolve. I think working with the user in conducting a preliminary analysis of what his problem is and what he wants to accomplish is very critical. In that period of time you should be able to come up with a reasonable definition of what his problem is and, in line with this, a specification of his needs." A state director of MIS stated, "As the individual user begins to work with his individual file, he becomes more learned in what data he has and gets quite enthused about getting other reports and using the data more effectively."

One of the most important activities relating to determining user needs is an analysis of existing data collection mechanisms. A state MIS director concluded that, "An early forms analysis was the best first move we could make." Current data collection exists in response to needs identified in the past, and analysis of it is clearly a good place to begin. Some data still needed will be found, and it provides a "handle" on what the process is about.

Several methods were indicated for use in getting information needs identified including: in-house questionnaires, interviews, group meetings, and tracing techniques (analyzing existing information flow). Any one of these methods provides a certain type of information. It was advised that more than one method is required to produce the full range of user needs. No matter which method is selected, the key ingredient must be personal contact with the user.

2. Prioritizing User Needs

There can be little doubt that certain information needs are more important than other information needs. Establishing information priorities in general is an activity of the state superintendent and his top management staff. As one state director of planning and evaluation said, "We do have the structure set up to establish priorities by the executive staff, and we feel the plan which exists was approved by the superintendent without question. We're following this plan, so that we feel we have total executive approval, in concept. We're not off and doing our own thing. I might candidly say that I think we probably should keep top staff a little better advised than we do."

On a more specific level, some attempts have been made to help potential users prioritize their own information needs. One state helped users categorize information needs into two categories: "I've got to have it right now" or "I need it, and I'll get it as soon as I can." In general, it seems as though categorizing into more than three categories such as: "required information needs," "highly desired information needs," and "would like to have information needs," is not a very beneficial activity.

3. Orienting Users

An orientation program for users is critical. As one director of MIS stated, "If you put a system in without training the user to use it, without his input before, during, and after, you are in trouble. My best failures have come from trying to put in a system without involving people and orienting them." The orientation program must be carefully planned in terms of participants, content, and sequencing. Orientation sessions should be coordinated with individual users or groups of users which have very similar information needs. Orientation session content should be relevant to the participants. It should be heavy on examples of MIS service and application and light on theory and computer technology. Orientation cannot occur in one session. Multiple sessions should be conducted and sequenced in relation to user readiness and level of sophistication.

4. Input and Forms Control

All six of the state MIS directors indicated a need for minimizing the duplication of information collection and reducing the collection of unnecessary data. The reason is two-fold: first, duplication and collection of unneeded data is inefficient and therefore costly; second, it irritates suppliers (who are also users, in many cases) and causes problems in rapport. Streamlining the data collection activities is very time-consuming and costly, however. One state MIS director put it this way: "We are concerned and aware of the fact that we do collect the same data more than we need to. We have tried to set up procedures for taking care of that, but we can't stop our ongoing business to do a thorough kind of study like this and overhaul the system. It is going to take us a period of time where we can increase the relevancy of data and reduce its duplication."

Forms control is an important aspect of increasing the efficiency of the data collection phase of MIS operations. There needs to be an MIS staff person in charge of developing, evaluating, and revising forms. He must have

the authority to make decisions regarding data collection mechanisms. Forms control is seen as a very time-consuming activity, but the time spent can pay high dividends in terms of efficiency and effectiveness. One state is using a somewhat different approach to forms control. "We're trying to get the users to be the forms control group. We've actually got the users coming to us and saying, 'we shouldn't be using this instrument.' We never had that two or three years ago. When the users are wanting to cut out forms and consolidate, that's what we want."

5. Ad hoc Requests for Information

Ad hoc requests for information do not seem to provide a great problem for state MIS personnel. Most requests can be handled fairly well; however, a few requests are difficult or impossible to meet. One state has kept a record of about 400 ad hoc requests in terms of needed information and format. Based on these requests, determinations were made concerning types of requests made most frequently so that these could easily be pulled from the data base.

6. Coordinating User Needs

The coordination of user needs across the agency is a concern that must be considered. One state stressed the need for defining data units as broadly as possible, in the context of both satisfying user needs and reducing duplication of data collection. Coordination of efforts is likely to be costly in terms of time and financial resources. The people interviewed indicated that coordination was necessary, however, and would provide for more reliable and efficient data collection and information manipulation.

Summary:

1. Determining user needs is a critical step in specifying data collection mechanisms and operational features of the MIS.
2. Determining user needs must be handled initially through a personal give-and-take relationship between MIS staff and potential users.
3. Determining user needs is not a one-time-only event, it is a continuous process which will likely require several data collection mechanisms.
4. It is essential that the user determine his own information priorities.
5. Orientation and training of MIS users requires a "public relations service" atmosphere and must include relevant examples of potential MIS outputs.
6. Orientation must be a continuous process based on maximum user participation.
7. Reduction in data collection and duplication is a primary concern of MIS staff personnel.
8. Forms control must be carefully conducted, on a continual basis with users having significant decision-making involvement in the process.
9. Ad hoc information requests are somewhat of a nuisance, but they can provide valuable guidelines for constructing MIS subsystems to be more responsive to regular users.
10. Coordination of data collection and user needs is seen as a way of making MIS operation more efficient and economical. Coordination must be done in terms of initial raw data collection.

VI. IDENTIFICATION AND PROCUREMENT OF RESOURCES

Planning and developing an MIS in the state department of education is very costly in terms of finances, material and equipment, and personnel. This section discusses four aspects of this problem:

1. Financial resources
2. Material and equipment resources
3. In-house personnel resources
4. The use of contractors or consultants.

1. Financial Resources

As was indicated in the nationwide survey, the average amount spent for MIS for the states responding was about $270,000 per year.

One common projection of MIS developmental costs is three million dollars over a period of three years. None of the six states indicated that it had this much money, nor did it see any possibility of getting that much. One respondent, being somewhat facetious, indicated that it would take "three million, plus or minus 100%." However, there was strong agreement that developing an MIS requires a great deal of financial support.

All of the states indicated that the insufficient financial resources affected the development of the MIS in several ways. First, it has put the MIS behind schedule and prevented the hiring of needed staff. One of the virtues of the people working an MIS must be patience. This was quite apparent when they talked about the effects of not enough money. As one state put it, "I think it's just a question of timing. In fact, I might inject that I think we will get more done for less over a longer period of time. We will have some failures, and frankly our failures will be less expensive because we're spending at a lower rate. The total cost will be less because of the way we are spending." Another state said, "One of the worst things that can happen is that somebody gives you a million dollars extra and then you have to spend the money. You get uncontrolled growth and more problems than if things are done slowly." Lack of money has required staff consolidation and economization through better design and procedures.

Much of the money for MIS development has come from federal sources supplemented by state funds. Some states are in a position to obtain some financial resources through charges for service. In every state there was great concern about the future of funding. Most feel they cannot continue to make substantial progress without federal assistance. As one state put it, "Some rather large corporations have gone under trying to develop MIS. I think the federal government is the only agency that has a big enough budget to develop MIS." Many of the states face the possibility of severe cutbacks in budgets that might effect MIS development. These states hope that the state superintendent sees the MIS as a high enough priority to continue funding on a satisfactory level.

2. Material and Equipment Resources

None of the states indicated that they presently had any hardware needs. On the contrary, they felt the only thing needed in terms of hardware might be additional storage space. However, software is a potential problem area. "The software to operate a complete management information system is another story, and I'm not sure that any of us are prepared at this time to say what the monetary needs are going to be in the development of a complete software system or the purchase of already prepared systems, whichever way we decide to go."

Another topic which was discussed was the centralization or decentralization of data processing. This topic must be viewed from two angles: in terms of data processing for SDE needs within the general state governmental organization, and in terms of data processing for information users at the district or local level.

Relative to a broad state government data processing capability, most SDE information system personnel would prefer to have data processing decentralized so that they have control of their own system. This would lead to maximum control and economy within the state departments of education and reduce the problem of

competing with other state agencies for priority in data processing.

In terms of data processing for district or local information users, many of the people we talked with felt data processing should be centralized. One state manager of a data processing division summed up the feelings of most of the people we talked with: "There are some disadvantages in centralization to a district that already has an on-going capability. They lose the autonomy and flexibility they had within their own system by becoming part of the state system. However, there are advantages which offset that; we can do more for them than they could do for themselves and probably in quicker time in a lot of cases than they were able to do for themselves. So there are some disadvantages in centralization; some are psychological, some are real."

3. Personnel Resources

This section will discuss the general topic of MIS developmental and operational personnel resources in terms of:

a. Staff qualifications and experience

b. Recruitment of staff

c. Effects of budgetary constraints on ability to recruit and maintain required staff

d. Activities involving the exchange of ideas and experiences with SDE MIS staff from other states.

a. Staff Qualifications and Experiences

Several skill and experience needs for MIS professionals were mentioned in the interviews. These are certainly not mutually exclusive categories, but do provide an overall picture of desired attributes of MIS professional staff. Qualifications and experiences mentioned were: a background in education, program management experience, communication experience, ability to work with people on their level and to help them identify needs, information requirements, problems and solutions, ability to synthesize, ability to play down the technical aspects of MIS, credibility to users, knowledge of systems, and experience in problem solving. Desired qualifications and experiences for technical personnel were: multiple data file experience, systems analysis experience, computer expertise, and software development experience.

b. Recruitment of Staff

In general, most of the MIS personnel in state departments of education have been recruited from within other SDE divisions or from other agencies of state government. As one state MIS director put it, "Typically in industry, history has shown that any time you bring a computer-type person into a business or firm, if he does not have the background of the firm, the communication gap is too great to transfer the needs of the firm to the development of that system. So, the concept is to take people with the (education) background and train them to be system analysts, give them the technical training. An educational background experience helps assure accuracy in the communication of needs and specifications for system definition. The predominant procedure is to take our own people who have interests and then work them in."

c. Effects of Budgetary Constraints

Budgetary constraints have had a considerable effect on MIS staffing. The lack of finances to hire and train MIS staff has resulted in slowing down of MIS developmental progress and has, in some cases, resulted in inordinately high work loads for present MIS staff. It has forced greater efficiency and prioritization of MIS developmental and operational tasks.

d. Participation with MIS Staff from Other SDE's

Most of the states indicated that they had participated with MIS personnel in other state departments to exchange ideas and work on problems of mutual concern. One state MIS director summed up his feelings by saying he recognized "that nobody else is solving the problem (of MIS in state departments of education) that well either; we were not really as stupid as we thought."

Several states indicated that a mechanism to provide for exchange of MIS developmental and operational information between states would be a beneficial activity, especially for states who were in the early phases of MIS planning and development. However, they cautioned that the benefit they could obtain would be re-

lated to the congruency between their own state of development and that of MIS in other state departments.

4. Use of Contractors or Consultants

One of the greatest problem areas is the use of contractors and consultants in MIS development. In general, the people we talked with were very skeptical of high reliance on contractors or consultants. To some extent, lack of funds has prevented the use of contractors and consultants, although the problem goes much deeper than just lack of finances. This problem will be discussed from two angles: (1) the use of contractors or consultants for MIS development and implementation, and (2) the purchase of existing software packages.

In terms of the use of contractors or consultants for MIS development and implementation, one state director of MIS said, "I don't know that we've suffered a great deal for not using them. To me, the problem with outside contractors is getting the job well enough defined and then being able to assign people to it, to work with them so that when the end product is developed it's our product. Usually, it's the contractor's product and it comes back and sits on the shelf and it's not worth anything . . . people trying to do the contracting are just not ready . . . most people usually wind up being somewhat disappointed because they can't use the product . . . you've got to supervise the contract more closely." He went on to state, "The reason why you contract is because you don't have any people to allocate to the task. That one fact will almost minimize or negate the product of the contractor." He suggested a general role for the use of contractors: "Contract for something you know how to do." Another state MIS director stated, "I'm afraid most of us don't know how to use contractors. The trick is in getting them to produce something we can use. Can we actually define the problem, define what we want him to do, follow up on him, make sure he's doing it, and get a product that is useful? The ultimate difficulty occurs when the problem becomes greater or otherwise changes dimensions after the contractor gets halfway through it. We would prefer to have everything done in-house. The catch is that quite often it is easier to get consultant funds than it is to get salary funds, and getting a position in a state department of education is like pulling teeth." Another respondent added, "If you really need the consultants to come in and tell you how to do it, you've got the wrong people working for you in the first place." Still another respondent stated, "I won't have them because they don't have to live with our problems. We want steady employees we have access to when we have problems. They have to live here, too, and they do the job."

Coupled with the problem of using contractors or consultants is the problem of purchasing software packages. Most of the people we interviewed cautioned against this practice. They much preferred to have software developed by in-house staff. One state department of education data processing manager said, "All people like to define their own staff and their own needs. Almost everything that has been acquired has provided us with information that we didn't need. The efficiency or effectiveness of the acquired software was not desirable in that modifications and adaptations had to be made . . . simply because our specifications differ from the ones these packages were developed under." He added, "We have good people, and when they develop software packages, we have the advantage of its being written to our own specifications, and we also have the people who can modify the software as well. In the case of some software that has been acquired, we have to get permission to make modifications. This is a deterrent to our effectiveness. I've always been biased in favor of putting your money in good people and then keeping them and having them develop your software." Another data processing manager told us that software packages "are all developed with a given hardware and operating system in mind and are developed to be compatible with that. If you put software with different hardware and operating systems, there has to be some modification; whenever you go out and purchase a product you have to expect that, because I don't think anybody has the same configuration you have or is using the same operating system that you have. That's one of the reasons we don't go out and purchase a package. We desire to do it ourselves for that very reason. That way when it's done, it's done on our equipment and operating system and we know it works."

Summary

Financial resources.

1. MIS budgets in the states average about a fourth of the common projection of MIS developmental costs.

2. Lack of financial resources has effected the ability to hire needed personnel and keep MIS development on schedule.

3. MIS developers see the lack of finances as impetus for more controlled, efficient MIS development.

4. MIS personnel demonstrate great concern about the future of funding, especially from federal sources.

5. It was projected that states will have to provide funding from state resources to a greater extent than they have in the past.

Material and equipment.

6. Access to computer hardware has not been a serious problem for most MIS projects.

7. Software development is a major concern of MIS developers.

8. MIS personnel tend to prefer having their own data processing unit separate from other state government data processing facilities.

Personnel.

9. Probably the most significant predictor of MIS success is the characteristics and methods of operations of MIS staff personnel.

10. MIS personnel should have a background in education and the desire and ability to learn systems concepts and skills required for meaningful relationships with MIS users.

11. Many MIS personnel would like to participate with their counterparts in other SDE's in an exchange of ideas and solutions to common problems.

Use of contractors or consultants.

12. The use of contractors or consultants in general is not viewed as being worthwhile.

13. MIS personnel tend to agree that it is difficult to create mutual understanding of problems between MIS staff and contractors or consultants.

14. Work conducted by contractors or consultants must be carefully monitored to insure that products are useful.

15. MIS personnel would much prefer to develop their own software packages in relation to their own hardware configuration and information needs.

16. Purchased software packages are often inefficient or in need of extensive modifications or adaptations.

17. Permission to modify a purchased software package can be difficult to obtain from the software contractor.

VII. SCHEDULING THE DEVELOPMENT OF MIS

Many factors relate to the ability to develop and maintain a schedule for MIS development. Among the primary factors are: financial resources, personnel resources, equipment and material resources, and success in getting understanding and involvement of top SDE administrators and users.

One state director of planning and evaluation stated, "When we got the time schedule developed and everybody said this is how long it will take, I would double it." Another person added his firm conviction that "people who develop plans and put dates on them and do not allow for the modification of those dates are most often the ones who fail. They insist on letting the plan run or develop the system from what they thought it should have been one or two years earlier."

One state indicated it was two years behind schedule. "Part of it was overoptimism. Developmental work takes a whole lot longer time than most people feel they can justify. They feel like if they get started then the delays can be explained away and you can continue to amend, but there's another factor involved. If you are developing anything for management, you've got to have management decisions constantly. I've found with the kinds of things I do, it takes as long to get a decision as it does to carry out the related activities. You can just double your time on getting decisions."

Thus, caution must be used in setting schedules, and there must be room for flexibility and schedule revision.

VIII. RELATIONSHIP BETWEEN MIS AND ACCOUNTABILITY

"Accountability is like taffy, all over you and no place to get a handle on it." This was a comment made by a state director of planning and evaluation. In general, there is lack of operational definitions of "accountability" in the states we talked with.

In one state, the legislature was examining bills to require the state superintendent to institute a state-wide testing program in subject matter areas for three grade levels. In another state, accountability was viewed as "holding school systems accountable for meeting their objectives" based on projected minimum standards that a local school must produce. Another state indicated that their legislature viewed accountability as "reduced costs."

No matter how a state defines accountability in education, it is obvious that the management information system will be expected to be responsive to related information needs at all levels of education. However, until accountability has actually been defined in a state department, the implications and specifications for the MIS role in providing timely, accurate information cannot be determined.

The MIS director in the state department of education must become involved in the development and prioritization of accountability activities, and he must provide input for determining information specifications and reporting formats in terms of mechanisms for the collection, storage, retrieval and dissemination of accountability information. Unfortunately, all too often the MIS director has little or no input into these decisions. Usually, he is told what information he will be required to provide, with little regard to the design and capabilities of the information system.

Certain types of information are relatively easy to obtain for the MIS while other types are very difficult to obtain. Information which is quantitative and easily defined is relatively easy to obtain and utilize. However, information that is conceptual or related to predicting opinions and legislative actions is extremely difficult to obtain, categorize, and use.

IX. EVALUATION OF MIS

Topics to be discussed in this section are:

1. Evaluation of MIS effectiveness
2. MIS as an aid to SDE planning and decision-making
3. Access to MIS controls — the confidentiality issue.

1. Evaluation of MIS Effectiveness

One of the biggest problem areas relative to MIS in state departments of education is the evaluation of the effectiveness of the system. None of the states we talked with felt they were doing an adequate job of evaluating the MIS, either in terms of formative (process) or summative (product) evaluation. Formative evaluation consists of activities designed to improve the on-going MIS process or operation. Summative evaluation is the evaluation of products of the MIS. Evaluation activities cannot be considered to be linear (having a starting point, specific sequential steps, and a specific ending point). Instead, they are cyclical; evaluation results from one series of observations are fed back into the system in terms of problem areas and modifications needed, and this recurs on a continual basis. In many cases it is difficult or impossible to categorize evaluation activities as being formative or summative. Each of these types of evaluation has overlapping implications and provides evaluative input for the other.

One strategy of formative evaluation was described by a state MIS director, "First we design subsystems and then periodically evaluate them against the performance requirements of the design. This is done to assure the effectiveness of the subsystem. We see evaluation as an integral part of this design. Evaluation goes into the design by way of a good description of the objectives of the system and its performance requirements, and then, after a period of time in operation, we determine whether the performance requirements are actually met." All of the states did conduct similar activities relating to formative evaluation.

Summative evaluations were usually very informal and somewhat subjective, based primarily on "success and cooperation from satisfied users. The way I evaluate it is if I haven't heard a complaint about the service, I'm not going to worry about it. The only complaint I think would be very serious would be if someone comes to me and says, 'Your staff isn't solving my needs; I can't talk to them.' As long as they talk to the staff, they get their problem solved. It's a matter of communications." Many of the people we talked with were interested in finding out better ways of conducting formal summative evaluations.

2. MIS as an Aid to SDE Planning and Decision Making

There was a general opinion that the MIS has definitely aided planning and decision making through the dissemination of timely, accurate information. As one state MIS director said, "I see some evidences that it (MIS) is bringing a more systematic approach to agency problems, and in a way this is nebulous. Yet one of our hopes for it is that if we can get the system set up and working, whenever anyone touches it, he will touch a system that will bring him in, and he will become part of the system instead of being out there on the side." None of the state MIS personnel would agree that they have reached the ultimate use of MIS in planning and decision making, but they do feel they are well on the way to making the MIS an extremely valuable resource.

Examples of how the MIS has aided state departments of education planning and decision making were:

1. The design of school finance, through the development of a school finance simulator
2. Ability to provide the legislature, governor, and state superintendent with reliable, timely, and accurate information
3. Evaluation of state department of education programs
4. Evaluation of local school districts in terms of meeting minimum standards as determined by the SDE
5. Providing feedback to the local school districts regarding the meeting of objectives and standards
6. Maintaining personnel records.

3. Access to MIS Controls — the Confidentiality Issue

Control of access into the MIS is a very important issue. Care must be used to insure that inappropriate access is prevented or minimized while, at the same time, legitimate access is not hampered. Policy guidelines must be developed with the input of users at all levels. Once developed, policy guidelines must be disseminated and then there must be a way of monitoring access. Confidentiality of information is a sticky issue. MIS personnel must be kept informed about court decisions and how they could effect MIS operation.

Summary:

1. Evaluation of MIS effectiveness should be a continuous activity.
2. Most MIS evaluation is in the form of informal formative or process evaluation carried on throughout the design and testing of the information system.
3. There is a need for the development of summative or product evaluation guidelines and for implementation of these evaluation techniques.
4. Current MIS operations have provided valuable information which has been used in MIS decision-making.
5. It is strongly urged that policy guidelines concerning access to the MIS be developed, with a high degree of involvement of MIS users.
6. MIS personnel must be aware of top SDE administrative, state government, and court decisions that effect access to MIS information.

X. CONCLUSIONS

States have used a variety of definitions and models in their MIS development. Each state tends to work on its own model which seems to be in an almost constant state of revision. The most pressing factors which lead to the development of an MIS were the needs for reporting information to federal and state government agencies and the availability of federal funds to support MIS development. The state superintendent was seen as an advocate for MIS development. However, many middle management personnel tended to demonstrate high anxiety and/or indifference to MIS development. In order to develop understanding, it is necessary to promote involvement, have MIS personnel who are accepting and patient, and provide potential users with examples of satisfactory service and quick pay-off.

Most states have given up on attempting to develop a global MIS to serve the total state department of education. Instead, they have attempted to develop components of a total MIS to serve specific operational needs which draw from an integrated or semi-integrated data base.

The extent to which potential MIS users are involved in all phases of MIS development and implementation is a critical predictor of MIS success. The key to involvement is personal contact which occurs in a responsive and reinforcing environment. Attempting to force involvement or provide token involvement usually results in mistrust and frustration for both MIS users and staff. It is vital to foster a sense of ownership through promotion of understanding the benefits and limitations of MIS and promoting the feeling that it is the user's information system.

User needs must be determined through a careful, time-consuming analysis of existing data mechanisms and identification of user concerns and problems. Specifications must then be developed for the MIS in terms of input, data manipulation, and output. It is necessary to coordinate data collection specifications across all agencies in the state department. Orientation programs must be carefully developed through the use of examples of MIS outputs and conducted in a non-threatening atmosphere.

Financial resources are always a concern of MIS developers. Most of the money that has been used has been from federal grants supplemented by state funds. The lack of funds has resulted in scheduling difficulties and lack of ability to hire needed staff. However, the MIS personnel consider the lack of funds somewhat as a positive influence in their ability to move at a more controlled, efficient pace.

Material resources do not seem to be a major problem in terms of needed hardware. However, there is a need for more software development. The practice of purchasing software packages is not very satisfactory. It was much preferred to have in-house software development.

Probably the most critical resource required for MIS development is personnel. Almost all of the people working on MIS have come from within the state department of education or other state agencies. They must have the ability to communicate and develop rapport with potential MIS users. They must be patient and encouraging in their dealings with potential users.

Contractors and consultants have not provided a great deal of help in MIS development. State MIS personnel are quick to admit that they must share the fault for this because of lack of ability to communicate exactly what they expect to be produced by contractors and consultants and lack of ability to supervise the work being done.

State MIS personnel indicated that it was difficult to keep MIS development on schedule for several reasons. Among them were: lack of financial resources, lack of personnel, and the necessity of waiting on management decisions. All of the MIS directors stressed the need for flexibility of scheduling.

The MIS is seen as having a critical role in any accountability or state-wide educational assessment program. However, until accountability has been defined operationally in the state, the MIS role and output requirements cannot be completely determined. It is critical that MIS personnel be deeply involved in the determination of a state's accountability model.

States have not conducted evaluation of the MIS on any highly formalized scale. Formative or process evaluation is built into the MIS design and specifications. Feedback from users provides a basis for changes and modifications in the system. About the only product or

summative evaluation is in terms of verbal or written comments made by MIS users. It is difficult to develop summative evaluation designs on a formalized basis because there is no one "product" coming from the MIS nor is there necessarily the same products from one time to the next. Product evaluation designs may be a critical concern when the MIS is more fully implemented.

A great deal of time, monies, and personnel resources have been expended for the planning, development, and implementation of MIS in state departments of education. Progress is slow and many times very frustrating. However, the state MIS personnel demonstrate a strong commitment to their task and seem to be making good progress in the face of sometimes seemingly impossible to overcome constraints and attitudes.

APPENDIX A

INTERVIEW SCHEDULE

INTERVIEW SCHEDULE OVERVIEW

Time span		Topic
20 min.	I.	Administrative details, introduction to purpose of monograph, opportunity for interviewees to ask questions.
30 min.	II.	Understanding of functions of MIS.
45 min.	III.	Involvement in planning of MIS.
30 min.	IV.	Determination of user needs.
		BREAK
60 min.	V.	Identification and procurement of resources.
20 min.	VI.	Scheduling.
30 min.	VII.	Evaluation and accountability.
20 min.	VIII.	Specification of other problem areas, suggestions for use of monograph.

INTERVIEW SCHEDULE

I. ADMINISTRATIVE DETAILS, ETC.

1. Overview of Service Agreement
2. CReWS role
3. Taping agreement
4. Interview overview
5. Interviewee access to results
6. Interviewee questions

II. UNDERSTANDING OF FUNCTIONS OF AN MIS.

1. Do you have a particular definition for an MIS in your SDE?
2. What factors led to your consideration of planning an MIS?
   a. Needs internal to SDE?
   b. Needs external to SDE?
3. Who (no names please) were the key advocates for an MIS? What did the advocates feel would be gained by an MIS?
4. Who, if any, (no names please) were the key opponents to an MIS? Why were they opposed?
5. What MIS model, if any, was used in your MIS planning? What criteria were used to evaluate the appropriateness of the model?
6. Is your strategy of MIS development based on the development of all components of the MIS simultaneously or is it to develop individual components of the MIS initially with plans for the integration of components in a latter phase of the project? What has been your reason(s) for your approach?
7. If you are taking the component approach, what are the components, which are highest completion priority, which are lowest completion priority?
8. Has your model changed since your initial conceptualization? How has it changed? What factors influenced this change?
9. What procedures were used or are being used to promote understanding of the functions and limitations of your MIS?

*Indicates Service Agreement priority question.

III. INVOLVEMENT IN PLANNING OF MIS.

1. Identify the major decision-makers (by title, not name) in your SDE.

*2. How successful have you been in getting major decision-makers, especially the top executive officer, in your SDE involved with and supportive of the development of the MIS?

3. What political realities effect the support of top SDE decision-makers? In what ways?

*4. With whom (by title, not name) have you had problems? What is the nature of these problems? How would you overcome these in any future work?

5. Could the problems associated with involvement have been minimized? If so, how?

*6. How important is it to foster a sense of personal involvement or "ownership" on the part of major SDE decision-makers?

7. What mechanisms have you used or do you suggest to keep major decision-makers informed about progress in the development of an MIS?

8. Does there seem to be a relationship between degree of involvement in the planning of an MIS and the degree to which decision-makers seek information from the MIS?

9. What persons or groups, not already mentioned, must be involved in the planning of an MIS?

IV. DETERMINATION OF USER NEEDS.

1. To what extent were potential users, external to the SDE, involved in the initial planning of the MIS, i.e., Federal, other state agencies, local SD's?

2. How are user needs determined? How are they prioritized? What is the scope of user needs? What user needs are in response to required information needs, highly desirable information needs, "would like to know" needs? How are needs categorized?

3. How have user needs changed since the beginning of your MIS planning?

4. Did you have an orientation program for potential users to familiarize them with MIS services and MIS input needs?

5. How successful was this program in terms of user understanding of their role in planning, providing input, and understanding of the information delivery system?

6. Are there any user needs unique to your state or geographic area?

7. How are "ad hoc" user requests handled?

V. IDENTIFICATION AND PROCUREMENT OF RESOURCES.

A. Financial resources.

1. To what extent did budgetary constraints effect initial MIS planning in terms of required staff personnel? In terms of equipment and materials?

*2. What level of financial resources did you project would be required to operationalize your MIS?

3. How does this projection compare with your latest assessment of MIS operationalization costs?

*4. To what extent has insufficient financial resources hampered your effort in different parts of the work?

*5. What level of budgetary support is needed and for what length of time to develop the MIS?

6. What are the primary sources of funds for your MIS development? About what percent of the total financial resources does each represent?

7. Do you predict any increase or decrease in financial support from any of the sources?

B. Material and equipment resources.

8. What were your material and equipment specifications made during the MIS planning?

9. Were these specifications realistic in terms of cost and adequacy?

10. To what extent did budgetary constraints effect those specifications?

11. Is your data processing centralized? What are the disadvantages and advantages of centralization, of decentralization?

C. Personnel resources

*12. What type of professional and technical staff is needed to develop the MIS?

*13. What type of professional and technical staff is needed to operate the MIS?

14. About what percent of your professional and technical staff have been recruited from other state agencies? About what percent have been recruited from outside of state agencies?

15. What qualifications and experiences do you feel professional MIS staff need?

16. What is your procedure for recruiting professional and technical staff from outside of state agencies?

17. To what extent have budgetary constraints effected your ability to recruit and maintain required personnel?

18. In what activities can contractors most effectively and most economically be involved in MIS development? Consultants?

19. Is specific application programming, rather than equipment design, for data processing output suitable for subcontracting or is it preferred to have application programming done by in-house personnel?

20. How have you participated with MIS personnel from other SDE's to exchange ideas and experiences? Do you feel this could be a beneficial activity?

VI. SCHEDULING.

1. What was (is) your projected time schedule for your MIS?

*2. Is the development of your MIS on schedule?

*3. What activities have been most difficult to keep on schedule? What has been the source of difficulties on these? How can these problems be overcome most effectively?

*4. If you were beginning the development or redevelopment of an MIS, what kind of time schedule would you set?

5. In what ways could more extensive initial overall planning have helped make up a more realistic time schedule?

6. What changes have occurred in staff-time allocations in relation to developmental activities?

VII. EVALUATION AND ACCOUNTABILITY.

1. What is the current status of accountability legislation in your state?

*2. In what ways do you think an MIS can support the implementation of accountability?

*3. Have you had discussions of the accountability – MIS relationship? If so, what has been the nature of these?

4. What is the nature of ongoing process or formative evaluation? Who has the primary responsibility for this activity?

5. What is the nature of product or summative evaluation? Who has primary responsibility for this?

6. What type of evaluation information is collected from users? How has this information effected changes in the MIS, if at all?

7. What type of information is collected from MIS staff regarding system operation?

8. In what ways has the MIS aided in SDE planning and decision-making?

9. What types of information are hardest to obtain?

10. What are the areas of information needs that the MIS serves well?

11. What are the areas of information needs that the MIS could serve better than it is currently serving?

12. What are the areas of information needs that the MIS cannot serve, if any?

13. What is your mechanism for forms control? Centralized? What problems have you had and what solutions have you developed?

14. Have you had problems relating to the confidentiality of information? Do you have a procedure for monitoring appropriate access to MIS output?

VIII. OPEN–ENDED SECTION.

1. Are there other problems or issues involving your MIS that we have not discussed?

2. What printed resource materials have you found useful in your MIS development?

3. In what ways could a monograph on problems and issues in MIS in SDE's be beneficial to you?

APPENDIX B

TAPINC AGREEMENT

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Agreement for Taping MIS Interviews

This Agreement, entered into on _____, between
Date
_____ and Jack Barnette of the Center for Cooperative Research with Schools,
Name of Primary Interviewee
The Pennsylvania State University, is to specify the reasons for taping the interview and the ultimate use of these tapes.

It is agreed that the taping of this interview is for the convenience of the interviewer in the collection of data for the preparation of a monograph "The Problems and Issues in Management Information System Development in State Departments of Education", as per a Service Agreement with the Alabama State Department of Education. It is agreed that during transcription of these tapes all names and references to particular states will be removed, and after verification of the accuracy of the transcription the tapes will be erased.

It is also agreed that the interviewee may at any point in the interview request that his responses not be recorded.

In addition, a copy of the transcription of the tapes will be made available to the primary interviewee only upon request.

_____ _____
Primary Interviewee Jack Barnette, CReWS

_____ _____
Title Date

_____
State

_____
Date

ALABAMA
STATE DEPARTMENT OF EDUCATION
MIS SPECIAL PROJECT PARTICIPANTS

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Frank T. Speed	Director, Division of Departmental Services
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Shilton L. Gilliland	Special Project Director

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